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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,304	01/20/2006	Wei Chen	0033-1055PUS1	7069
2292 7590 04/10/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
DOERRLER, WILLIAM CHARLES				
ART UNIT		PAPER NUMBER		
3744				
NOTIFICATION DATE		DELIVERY MODE		
04/10/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/565,304

**Applicant(s)**

CHEN ET AL.

**Examiner**

William C. Doerrler

**Art Unit**

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 16-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/ISD)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_
- Paper No(s)/Mail Date 1-20-2006, 8-31-2006

## DETAILED ACTION

### *Election/Restrictions*

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-15, drawn to a heat exchange system for use with a Stirling cooler that comprises an evaporator with a liquid inlet closer to the heat source than the vapor outlet.

Group II, claim(s) 16 and 17, drawn to a heat exchange system with a preventer to prevent liquid entering the vapor conduit.

Group III, claim(s) 18 and 19, drawn to a heat exchange system with a liquid inlet positioned between 2 vapor outlets.

Group IV, claim(s) 20-24, drawn to a heat transfer system with a roughened surface.

The inventions listed as Groups I, II, III or IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Each of the groups contains a mutually exclusive inventive feature. The liquid outlet being closer to the heat source than the vapor outlet is claimed only in Group I. The preventer is claimed only in group II. The liquid inlet between two vapor outlets is only claimed in

group III. The roughened surface is claimed only in group IV. As the groups each claim different special technical features, restriction is deemed appropriate.

During a telephone conversation with Charles Gorenstein on 3-31-2008 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al (2005/0172644).

Zhang discloses a Stirling cooler with a heat transfer system associated with the heat emitting portion (5) which comprises an evaporator (1) and a condenser (3). The evaporator has a liquid inlet (4a) that extends closer to the heat source than the vapor outlet.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Pereira et al (2005/0210885).

Zhang et al discloses applicants' basic inventive concept, a Stirling cooler with a heat removal system with an annular evaporator with the liquid inlet closer to the annular heat source than the vapor outlet, substantially as claimed with the exception of placing the vapor outlet on the annular outer surface of the evaporator and placing the liquid inlet in an axial wall. Pereira et al show this feature to be old with line 80 leaving the top of the evaporator and line 70 entering the side wall. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Pereira et al to modify the heat transfer system of Zhang et al by using a vapor outlet on the annular wall and a liquid inlet on the axial wall to provide a natural circulation of the fluid in the system.

Claims 6-8 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of either Wahle et al (5,803,161) or Larson et al (5,502,582). Zhang et al disclose applicants' basic inventive concept, a Stirling cooler with a heat removal system with an annular evaporator with the liquid inlet closer to the annular heat source than the vapor outlet, substantially as claimed with the exception of using multiple evaporator sections for a common condenser. Wahle et al and Larson et al each show this feature to be old in the heat pipe heat transfer art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of either Wahle et al or Larson et al to modify the heat transfer system of Zhang et al by using multiple evaporator sections with a common condenser to ensure a more even thermal profile for the area being cooled by spreading the area being cooled.

Claims 9,10,14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of either Wahle et al or Larson et al as applied to claims 6-8 and 11-13 above and further in view of Pereira et al (2005/0210885). Zhang et al, as modified, discloses applicants' basic inventive concept, a Stirling cooler with a heat removal system with a mult-sectioned annular evaporator with the liquid inlet closer to the annular heat source than the vapor outlet, substantially as claimed with the exception of placing the vapor outlet on the annular outer surface of the evaporator and placing the liquid inlet in an axial wall. Pereira et al show this feature to be old with line 80 leaving the top of the evaporator and line 70 entering the side wall. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Pereira et al to modify the heat transfer system of Zhang et al by using a vapor outlet on the annular wall and a liquid inlet on the axial wall to provide a natural circulation of the fluid in the system.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chen et al and both Sone patents show Stirling coolers with heat pipe heat transfer systems. Barrash et al and Bechowitz et al show Stirling refrigerators with heat transfer systems. Sugito '690 shows a heat pipe heat transfer system. Sugito '757 shows a heat pipe heat transfer system with figure 25 showing lower liquid inlets compared to the vapor outlet. Takano shows a heat transfer system with a port on the annular wall and a port on the axial wall. Muller et al show a heat transfer system with a liquid inlet closer to the heat source than the vapor outlet.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerfler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Primary Examiner  
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WCD

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